Abstract of the Disclosure:

In a semiconductor device formed on a silicon surface which has a substantial (110) crystal plane orientation, the silicon surface is flattened so that an arithmetical mean deviation of surface Ra is not greater than 0.15nm, preferably, 0.09nm, which enables to manufacture an n-MOS transistor of a high mobility. Such a flattened silicon surface is obtained by repeating a deposition process of a self-sacrifice oxide film in an oxygen radical atmosphere and a removing process of the self-sacrifice oxide film, by cleaning the silicon surface in deaerated H_2O or a low OH density atmosphere, or by strongly terminating the silicon surface by hydrogen or heavy hydrogen. The deposition process of the self-sacrifice oxide film may be carried out by isotropic oxidation.